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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,316	11/17/2003	Xiaochun Nie	APLE.P0036	5248

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EXAMINER	
WERNER, DAVID N	
ART UNIT	PAPER NUMBER
2621	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/03/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/716,316	NIE ET AL.	
	Examiner	Art Unit	
	David N. Werner	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 November 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informality: on page 6, lines 13-14, there is an incomplete sentence.

Appropriate correction is required.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140

F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1, 2, 5, 6, 8, 9, 12, and 13 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 4, 16, and 19 of copending Application No. 10/716,265. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of both applications are directed to preventing overflow or underflow in a buffer in a video encoder by changing the scaling of the quantizer according to frame complexity. Therefore, the two inventions are obvious variants of each other. Method claims 1, 2, 5, and 6 of the present invention are related to method claims 1 and 4 of the conflicting invention, and computer-readable medium claims 8, 9, 12, and 13 of the present invention are related to computer-readable medium claims 16 and 19 of the conflicting invention.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 3, 4, 10, and 11 rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted element is: the value from which the product of the scaling value and scaling relaxation value is subtracted.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claims 8-14 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The word "comprising" is not considered sufficient for linking a computer program with a computer-readable medium in statutory form. An acceptable form of the preamble of claim 8 reads, "A computer readable medium encoded with computer executable instructions for implementing a method of scaling digital video information, said set of computer executable instructions performing:" and an acceptable form of the preamble of claim 12 reads, "A computer readable medium encoded with a set of computer executable instructions for tracking digital video information complexity, said set of computer instructions performing:". See *Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

9. Claims 1-14 are rejected under 35 U.S.C. 101 because the claimed invention lacks patentable utility. Although the specification discloses a video encoder, the steps claimed only teach setting quantization parameters, not an actual analog-to-digital conversion of data, or a resultant step with the calculated parameters. Therefore, the claimed invention lacks a useful, concrete, and tangible result. See *Arrhythmia*, 22 USPQ2d 1033 and *AT&T*, 50 USPQ2d 1447.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 5-7 and 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 6,160,846 A (Chiang et al). Chiang et al. teaches a method and apparatus for encoding a video that selects a quantizing scale to maintain video quality. Regarding claim 5, figure 2 of Chiang et al. shows coding method 200, which constrains the quantizing scale to control the bit rate (column 9, lines 46-49). Among other constraints, the quantizing scale depends on a complexity model (column 10, lines 18-27). The baseline model sets the complexity X of a macroblock i as the product of bit rate R and quantizer scale Q. The initial complexity value is set according to encoding of previous pictures of the same type currently encoded (column 10, lines 33-49). Regarding claims 6 and 7, the complexity factors are updated according to a polynomial

regression model or quadratic regression model (column 11, lines 12-16). The range of allowed predicted complexity values then depends on the exact model used. Regarding claims 12-14, Chiang et al. discloses a software embodiment of the invention (claims 18-23).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 1-4 and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiang et al. in view of US Patent 7,079,581 B2 (Noh et al). Regarding claims 2 and 10, in a second embodiment of Chiang et al., a quantizer scale in a video encoder depends on buffer fullness (column 13, line 60 – column 14, line 6). Chiang allows the target bit rate of a frame to change to minimize distortion (column 14, lines 17-46), but assumes that pictures of the same type will have a similar bit rate (column 13, lines 35-41).

Noh et al. teaches a variable-bit-rate video encoder that models complexity based on motion vectors or mean absolute differences of the encoded frames. Regarding claims 1 and 9, Noh et al. teaches calculating quantization factor Q of present frame t using deviation parameter D, which is based on the ratio of current bit rate to target bit rate (column 8, lines 4-53). This adjustment to the quantization factor

is only done when the quantization factor would otherwise be outside a set range of allowed values (column 7, lines 54-66).

Chiang et al. discloses the claimed invention except for adjusting the quantization of an encoder based on a relaxation factor in order to prevent buffer overflow or underflow. Noh et al. teaches that it was known to adjust quantization according to a deviation parameter to stay with a target bit rate. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust a quantization factor according to a large deviation from a target bit rate as taught by Noh et al., since Noh et al. states in column 8, lines 61-67, that such a modification would preserve image quality in the event of a sudden increase in image complexity.

Regarding claims 3, 4, 10, and 11, Noh et al. calculates quantization factor Q(t) as $(1\pm K) \times Q(t-1)$, where K is the product of a limitation parameter and a deviation parameter (column 8, lines 4-14). Then a scaling value is calculated by subtracting the product of the scaling value and a scaling relaxation value from the scaling value.

Noh et al. discloses the claimed invention except the present invention adds a relaxation factor as an extra term to the calculation of a scaling factor. However, it would have been an obvious matter of design choice to add an extra term to the equation of Noh et al., since applicant has not disclosed that the exact algorithm claimed for adjusting a scaling factor based on a relaxation factor solves any stated problem or is for any particular purpose, and it appears that the invention would perform equally well using the algorithm of Noh et al.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- US Patent 5,231,484 A (Gonzales et al.)
- US Patent 5,654,760 A (Ohtsuki et al.)
- US Patent 6,510,176 B1 (Fukuda et al.)
- US Patent 6,944,221 B1 (Keesman et al.)
- US Patent Application Publication 2001/0000704 A1 (Fert et al.)
- "Complexity Based Rate Control for MPEG Encoder" (Chow et al.)
- "On the Error Distribution and Scene Change for the Bit Rate Control of MPEG" (Lee et al.)
- Analysis of a Two Step MPEG Video System (Teixeira et al.)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David N. Werner whose telephone number is (571) 272-9662. The examiner can normally be reached on Monday-Friday from 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DNW

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